

CLAIMS

What is claimed is:

- 1 1. Electromechanical linear drive for an injection molding machine, the
2 drive comprising:
 - 3 a motor housing containing a stator;
 - 4 a hollow cylindrical rotor received concentrically in the housing to form an
 - 5 electric motor having a magnet gap between the rotor and the stator, the rotor having an
 - 6 open end, a closed end, and a central bearing journal extending axially outward from
 - 7 the closed end;
 - 8 a helical gear connected to the rotor for converting rotational movement of
 - 9 the rotor to linear movement;
 - 10 at least two axially pretensioned individual bearings supporting the journal
 - 11 for rotation in the housing, the bearings being spaced apart axially and absorbing
 - 12 longitudinal and transverse forces in opposite directions; and
 - 13 an anti-contact device located at open end of the rotor for preventing
 - 14 contact between the rotor and the housing in the event of eccentric deflection of the
 - 15 rotor with respect to the stator.
- 1 2. An electromechanical linear drive as in claim 1 wherein the anti-
2 contact device comprises an anti-contact bearing having a radial clearance between
3 the open end of the rotor and the motor housing, the radial clearance being less than
4 the magnet gap.

1 3. An electromechanical linear drive as in claim 1 wherein the anti-
2 contact device comprises one of a fluid dynamic radial bearing and a magnetic radial
3 bearing mounted at the open end of the rotor.

1 4. An electromechanical linear drive as in claim 1 wherein the anti-
2 contact device comprises a sensor which senses eccentric deflection of the rotor with
3 respect to the stator and shuts off the motor when the deflection exceeds a
4 predetermined deflection.

1 5. An electromechanical linear drive as in claim 4 wherein the sensor
2 is a contact sensor mounted on the motor housing adjacent to the open end of the rotor
3 at a distance from the rotor which is smaller than the magnet gap.

1 6. An electromechanical linear drive as in claim 1 wherein the anti-
2 contact device comprises at least three radial bearings which are uniformly distributed
3 about the open end of the rotor and support the rotor radially with respect to the stator.

1 7. An electromechanical linear drive as in claim 1 wherein the helical
2 gear generates a maximum axial thrust, the individual bearings being adjusted to have
3 a pretensioning force which is greater than the maximum axial thrust.

1 8. An electromechanical linear drive as in claim 1 wherein the helical
2 gear is fixed concentrically in the cylindrical rotor and extends toward the open end.

1 9. An electromechanical linear drive as in claim 8 wherein the helical
2 gear consists of a spindle gear arranged to drive a plasticizing unit of an injection
3 molding machine back and forth.